ABSTRACT

A method and system are presented for fast generation of one or more 2D DRRs of an object. 3D scan data of the object (such as CT scan data) are generated. A 3D fast Fourier transform F(u,v,w) is computed for a 3D scan volume f(x,y,z) within the 3D scan data, the scan volume f(x,y,z) having an orientation (θ, ϕ, φ). The 3D Fourier transform data are resampled along a surface S(θ, ϕ, φ, u', v') at angles θ, ϕ, φ corresponding to the orientation of the scan volume. The surface S is a plane for parallel beam geometry. For cone-beam geometry, it is the surface of a sphere whose center is coincident with the imaginary origin of the X-rays for the projection. The 2D inverse Fourier transform F^{-1} [S(θ, ϕ, φ, u', v')] of the surface is computed, thereby generating a 2D DRR reconstructed along a projection direction perpendicular to the sample surface.